II. Listing of Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A method comprising:

providing a semiconductor alloy layer on a semiconductor substrate;

forming a gate structure on the semiconductor alloy layer;

forming source and drain regions in the semiconductor substrate on both sides of the gate structure;

removing at least a portion of the semiconductor alloy layer overlying the source and drain regions; and

forming a metal silicide region over the source and drain regions.

2. (Original) The method of claim 1 wherein removing at least a portion of the semiconductor alloy layer comprises etching the semiconductor alloy layer.

3. (Original) The method of claim 1 wherein removing at least a portion of the semiconductor alloy layer comprises exposing the semiconductor alloy layer to an etchant for a period of time until the semiconductor alloy layer overlying the source and drain regions is fully removed.

4. (Original) The method of claim 3 wherein forming a metal silicide region comprises forming a metal silicide region having a metal selected from the group consisting of cobalt and titanium.

5. (Original) The method of claim 1 wherein removing at least a portion of the semiconductor alloy layer comprises using an anisotropic reactive ion etch to remove at least a portion of the semiconductor alloy layer.

6. (Original) The method of claim 1 wherein removing at least a portion of the semiconductor alloy layer comprises:

altering at least a portion of the semiconductor alloy layer to a material receptive to a selective removal process; and

selectively removing the altered semiconductor alloy layer from overlying the source and drain regions.

7. (Original) The method of claim 1 wherein removing at least a portion of the semiconductor alloy layer comprises:

oxidizing at least a portion of the semiconductor alloy layer to form a silicon oxide material receptive to a selective wet etch process; and

selectively removing the altered semiconductor alloy layer from overlying the source and drain regions.

8. (Original) The method of claim 1 wherein removing at least a portion of the semiconductor alloy layer comprises:

oxidizing at least a portion of the semiconductor alloy layer to form a silicon oxide material receptive to a selective dry etch process; and

selectively removing the altered semiconductor alloy layer from overlying the source and drain regions.

9. (Original) The method of claim 1 wherein removing at least a portion of the semiconductor alloy layer comprises:

consuming at least a portion of the semiconductor alloy layer to form a metal silicide material receptive to a selective wet etch process; and

selectively removing the altered semiconductor alloy layer from overlying the source and drain regions.

10. (Original) The method of claim 1 wherein removing at least a portion of the semiconductor alloy layer comprises:

consuming at least a portion of the semiconductor alloy layer to form a metal silicide material receptive to a selective dry etch process; and

selectively removing the altered semiconductor alloy layer from overlying the source and drain regions.

11. (Original) The method of claim 1 wherein removing at least a portion of the semiconductor alloy layer comprises:

forming a metal layer over the semiconductor alloy layer overlying the source and drain regions;

annealing the metal layer and the semiconductor alloy layer and forming a metal silicide material; and

selectively etching the metal silicide material.

12. (Original) The method of claim 1 wherein removing at least a portion of the semiconductor alloy layer comprises:

forming a metal layer over the semiconductor alloy layer overlying the source and drain regions;

annealing the metal layer and the semiconductor alloy layer and forming a disposable metal silicide material;

selectively etching the disposable metal silicide material overlying the source and drain regions;

forming a second metal layer; and

annealing the second metal layer and forming a second metal silicide material.

13. (Original) The method of claim 1 wherein removing at least a portion of the semiconductor alloy layer comprises:

forming a metal layer over the semiconductor alloy layer overlying the source and drain regions;

annealing the metal layer and the semiconductor alloy layer and forming a metal-semiconductor alloy layer overlying the source and drain regions;

implanting ions of at least one predetermined species into at least a portion of the metal-semiconductor alloy layer; and

annealing the metal-semiconductor alloy layer and forming a metal silicide material .

14. (Original) The method of claim 1 wherein removing at least a portion of the semiconductor alloy layer comprises:

forming a metal layer over the semiconductor alloy layer overlying the source and drain regions;

implanting ions of at least one predetermined species into at least a portion of the metal layer;

annealing the metal layer and forming a metal-semiconductor alloy layer overlying the source and drain regions; and

annealing the metal-semiconductor alloy layer and forming a metal silicide material overlying the source and drain regions.

15. (Original) The method of claim 1 wherein the semiconductor alloy layer comprises SiGe.

16. (Original) The method of claim 11 wherein anneal the metal layer comprises performing a rapid thermal anneal process.

17. (Original) A method of forming a semiconductor device, comprising:

forming a gate structure on a semiconductor alloy layer in a semiconductor substrate;

forming source and drain regions in the semiconductor substrate on both sides of the gate structure;

altering at least a portion of the semiconductor alloy layer overlying the source and drain regions; and

removing, at least partially, the altered semiconductor alloy layer overlying the source and drain regions.

18. (Original) The method of claim 17, further comprising forming a metal silicide layer over the source and drain regions.

19. (Original) The method of claim 17 wherein removing the altered semiconductor alloy layer comprises etching the semiconductor alloy layer.

20. The method of claim 17 wherein removing the altered semiconductor alloy layer comprises exposing the altered semiconductor alloy layer to an etchant for a period of time until the semiconductor alloy layer overlying the source and drain regions is fully removed.

21. (Original) The method of claim 18 wherein forming a metal silicide region comprises forming a metal silicide region having a metal selected from the group consisting of cobalt and titanium.

22. (Original) The method of claim 17 wherein removing the altered semiconductor alloy layer comprises using an anisotropic reactive ion etch to remove at least a portion of the altered semiconductor alloy layer.

23. (Original) The method of claim 17 wherein altering and removing at least a portion of the semiconductor alloy layer comprises:

oxidizing at least a portion of the semiconductor alloy layer to form a silicon oxide material receptive to a selective etch process; and

selectively removing the altered semiconductor alloy layer from overlying the source and drain regions.

24. (Original) The method of claim 17 wherein altering and removing at least a portion of the semiconductor alloy layer comprises:

consuming at least a portion of the semiconductor alloy layer to form a metal silicide material receptive to a selective etch process; and

selectively removing the altered semiconductor alloy layer from overlying the source and drain regions.

25. (Original) The method of claim 17 wherein altering and removing at least a portion of the semiconductor alloy layer comprises:

forming a metal layer over the semiconductor alloy layer overlying the source and drain regions;

annealing the metal layer and the semiconductor alloy layer and forming a metal silicide material; and

selectively etching the metal silicide material.

26. (Original) The method of claim 17 wherein altering and removing at least a portion of the semiconductor alloy layer comprises:

forming a metal layer over the semiconductor alloy layer overlying the source and drain regions;

annealing the metal layer and the semiconductor alloy layer and forming a disposable metal silicide material;

selectively etching the disposable metal silicide material overlying the source and drain regions;

forming a second metal layer; and

annealing the second metal layer and forming a second metal silicide material.

27. (Original) The method of claim 17 wherein altering and removing at least a portion of the semiconductor alloy layer comprises:

forming a metal layer over the semiconductor alloy layer overlying the source and drain regions;

annealing the metal layer and the semiconductor alloy layer and forming a metal-semiconductor alloy layer overlying the source and drain regions;

implanting ions of at least one predetermined species into at least a portion of the metal-semiconductor alloy layer; and

annealing the metal-semiconductor alloy layer and forming a metal silicide material .

28. (Original) The method of claim 17 wherein altering and removing at least a portion of the semiconductor alloy layer comprises:

forming a metal layer over the semiconductor alloy layer overlying the source and drain regions;

implanting ions of at least one predetermined species into at least a portion of the metal layer;

annealing the metal layer and forming a metal-semiconductor alloy layer overlying the source and drain regions; and

annealing the metal-semiconductor alloy layer and forming a metal silicide material overlying the source and drain regions.

29. (Original) The method of claim 17 wherein the semiconductor alloy layer comprises SiGe.

30. (Withdrawn) A semiconductor device comprising:

a substrate;

a gate structure formed over the semiconductor alloy layer;

source and drain regions formed on both sides of the gate structure in the substrate; and

a semiconductor alloy layer in the substrate below the gate structure but absent from the source and drain regions.

31. (Withdrawn) The semiconductor device of claim 30, wherein the semiconductor alloy layer comprises SiGe.

32. (Withdrawn) The semiconductor device of claim 30, further comprising a metal silicide layer over the source and drain regions.

33. (Withdrawn) The semiconductor device of claim 30, further comprising a partial layer of semiconductor alloy layer in the substrate overlying the source and drain regions.